CLAIMS

1. A communication apparatus comprising a turbo encoder, wherein said turbo encoder includes a rearrangement unit which,

generates N types of random series by arranging random series generated by using prime numbers in a buffer of N (where N is a natural number) rows × M (where M is a natural number) columns and rearranging bits in rows by using the random series;

maps interleaver-length data series on the rearranged N types of random series;

generates a final rearrangement pattern by replacing rows in the mapped data series in accordance with a predetermined rule; and

reads the generated rearrangement pattern in columns.

2. The communication apparatus according to claim 1, wherein when two information bit series are input into said turbo encoder, said rearrangement unit rearranges the two information bit series so that the inter-signal-point distances of the two information bit series do not become 0.

3. A communication apparatus comprising a turbo encoder, wherein said turbo encoder includes a rearrangement unit

which,

generates N types of random series by arranging random series generated by using prime numbers in a buffer of N (where N is a natural number) row × M (where M is a natural number) columns and shifting the random series one column by one column in rows;

maps interleaver-length data series on the shifted N types of random series;

generates a final rearrangement pattern by replacing rows in the mapped data series in accordance with a predetermined rule; and

reads the generated rearrangement pattern in columns.

4. The communication apparatus according to claim 3, wherein when two information bit series are input into said turbo encoder, said rearrangement unit rearranges the two information bit series so that inter-signal-point distances of the two information bit series do not become 0.

5. A communication method of rearranging information bit series in a turbo encoder, the method comprising:

a random-series generation step of generating N types of random series by arranging random series generated by using prime numbers in a buffer of N (where N is a natural number) rows × M (where M is a natural number) columns and

rearranging bits in rows by using the random series;

a mapping step of mapping interleaver-length data series on the rearranged N types of ransom series;

a rearrangement-pattern generation step of generating a final rearrangement pattern by replacing rows in the mapped data series in accordance with a predetermined rule; and

a read step of reading the generated rearrangement pattern in columns.

6. The communication method according to claim 5, wherein when two information bit series are further input into said turbo encoder, the two information bit series are rearranged so that inter-signal-point distances of the two information bit series do not become 0.

7. A communication method of rearranging information bit series in a turbo encoder, the method comprising:

a random-series generation step of generating N types of random series by arranging random series generated by using prime numbers in a buffer of N (where N is a natural number) rows × M (where M is a natural number) columns and shifting the random series one column by one column in rows;

a mapping step of mapping interleaver-length data series on the shifted N types of random series;

a rearrangement-pattern generation step of generating

a final rearrangement pattern by replacing rows in the mapped data series in accordance with a predetermined rule; and

a read step of reading the generated rearrangement pattern in columns.

8. The communication method according to claim 7, wherein when two information bit series are further input into said turbo encoder, the two information bit series are rearranged so that inter-signal-point distances of the two information bit series do not become 0.